

# Effect of a Surgical Site Infection Prevention Bundle on Caesarean Section Surgical Site Infections at a Regional Hospital

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## Background & Aim

Caesarean section (CS) is one of the most commonly performed surgical procedures in obstetrics, accounting for approximately 39% of births in Australia. Surgical site infections (SSI) remain a significant source of maternal morbidity and are associated with increased pain, delayed recovery, prolonged hospitalisation, additional antibiotic exposure, emergency department presentations, and avoidable healthcare utilisation. International studies report SSI rates between 8% and 15%, while reported Australian rates vary due to differences in surveillance methodology and reporting systems.

A 2023 audit at Redlands Hospital reviewed 587 caesarean sections and identified an SSI rate of 5.6%. The audit demonstrated several opportunities for improvement in perioperative practice, including low utilisation of vaginal preparation, inconsistent use of negative pressure wound therapy (PICO) dressings for high-risk women, and variation in antimicrobial prophylaxis practices. These findings prompted development and implementation of a multidisciplinary SSI prevention bundle in October 2024.

### What is the SSI Bundle?

1. Iodine based vaginal preparation for all emergency CS
2. Ensuring weight based Cefazolin IV (3g if Wt >120kg or BMI >40), ideally >1hr prior to knife to skin
3. Use of PICO dressing if BMI > 40
4. Ongoing education and upskilling of the Obstetric and OT teams



**Aim:** evaluate impact on SSI rates, vaginal preparation compliance, weight-adjusted antibiotic prophylaxis, timing of antimicrobial prophylaxis administration and PICO utilisation.

## Methods

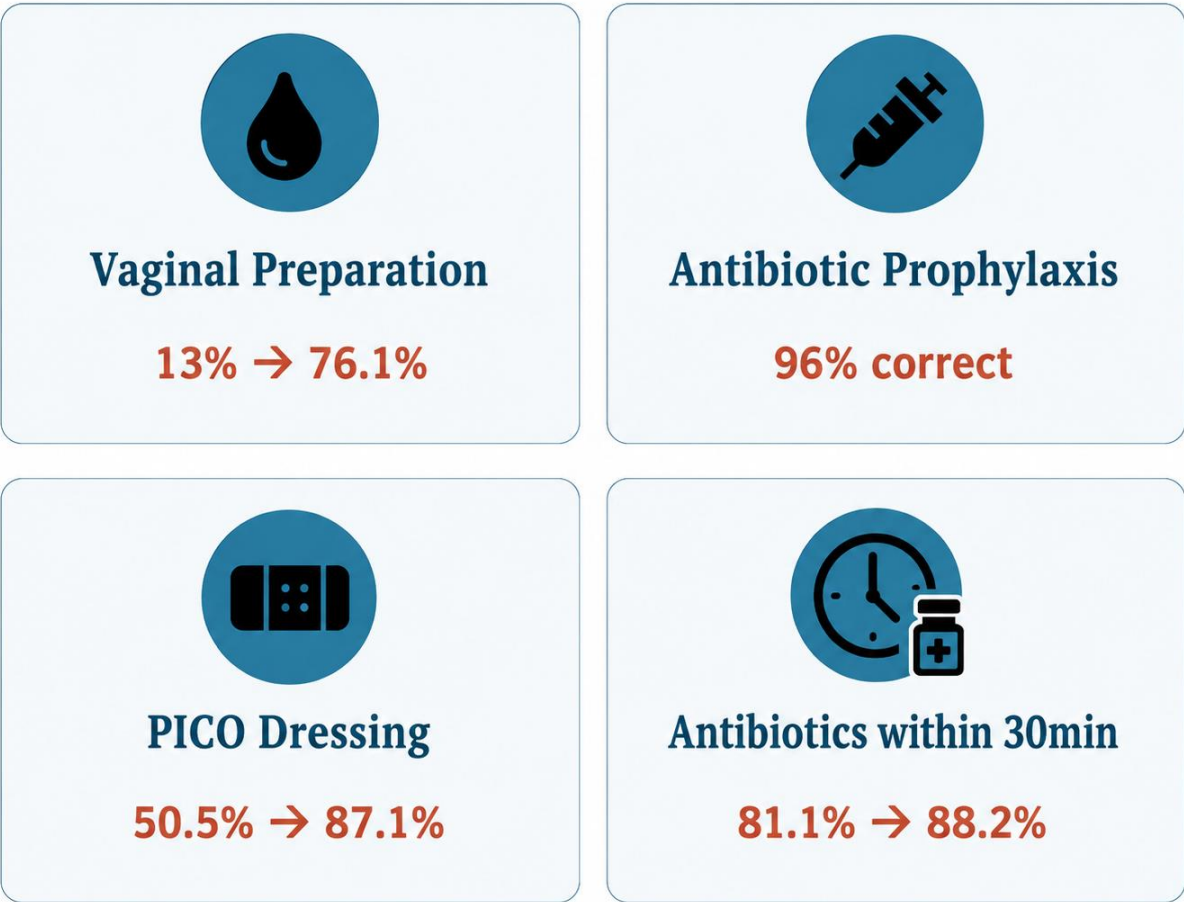
A retrospective audit was undertaken of all elective and emergency caesarean sections performed at Redlands Hospital between October 2024 and March 2025 following implementation of the SSI prevention bundle.

A total of 285 women were included. No exclusion criteria were applied. Data were extracted from the Queensland Health integrated electronic medical record (iEMR). Patient demographic characteristics, obstetric history, gestational age at delivery and indication for caesarean section were obtained.

Process measures evaluated included vaginal preparation, weight-adjusted intravenous antibiotic prophylaxis, timing of antibiotic administration relative to knife-to-skin incision and use of PICO negative pressure wound dressings.

Infection outcomes included SSI diagnosis, need for oral or intravenous antibiotics, hospital readmission, return to theatre and inpatient length of stay.

## Effect of the SSI Bundle (2023 → 2025)



## Results & Clinical Outcomes

Twenty surgical site infections were identified during the audit period, representing an overall SSI rate of 7.01%. Compliance with several evidence-based preventive measures improved substantially compared with the 2023 audit.

Overall vaginal preparation was documented in 49.1% of caesarean sections. Among emergency caesarean sections, compliance increased to 76.1%, representing a marked improvement compared with approximately 13% in 2023.

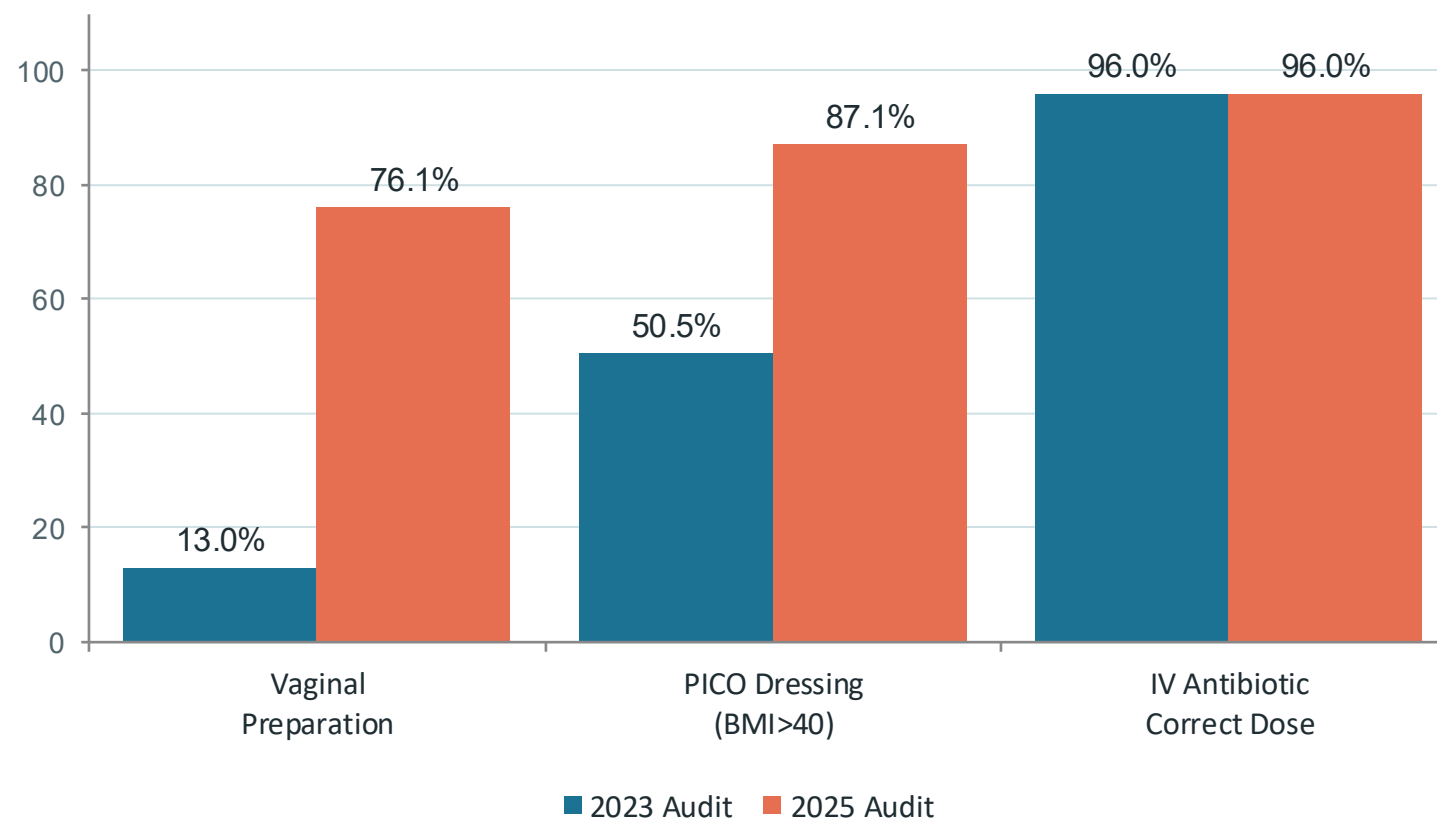
Use of PICO dressings also increased substantially. Among women with BMI >40, 87.1% received PICO dressings compared with 50.5% in 2023.

Appropriate weight-adjusted antibiotic prophylaxis remained excellent, with 96% of women receiving the correct dose. However, administration timing relative to knife-to-skin incision demonstrated limited improvement.

Women who developed SSI were more likely to have obesity, type 2 diabetes mellitus, induction of labour and prolonged operative duration.

Six women required hospital admission for management of postoperative wound infection for IV antibiotics. One patient required return to theatre with surgical washout of a subcutaneous wound infection. Mean inpatient length of stay was 4.3 days, although this was significantly influenced by one complex infection requiring extended management. The majority of remaining infections were successfully treated with oral antibiotics and outpatient wound review.

## Compliance with SSI Bundle Measures (2023 v 2025)



## Discussion

Implementation of a multidisciplinary SSI prevention bundle resulted in significant improvement in adherence to several perioperative practices. The most notable improvements were observed in rates of vaginal preparation and PICO dressing utilisation among women at highest risk of wound complications.

These findings demonstrate that relatively simple interventions, supported by targeted education and standardised clinical pathways, can successfully modify practice patterns within a regional maternity service.

Despite improvements in process measures, antibiotic timing remains an ongoing challenge. This is particularly evident during emergency caesarean sections, where competing clinical priorities may limit opportunities for prophylaxis administration within recommended timeframes.

The persistence of clinically significant SSI rates despite improved compliance suggests that ongoing quality-improvement initiatives and enhanced surveillance remain necessary.

## Conclusion

Implementation of an SSI prevention bundle improved compliance with key evidence-based interventions, particularly vaginal preparation and PICO dressing utilisation. Appropriate antibiotic dosing remained high, while antibiotic timing continues to represent an opportunity for improvement. Ongoing multidisciplinary engagement and surveillance will be essential to further reduce the burden of post-caesarean surgical site infection.

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